



Leveraging U.S. Treasury Bonds Using the Futures Market

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by Eric Hickman

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In my prior article, I showed why leveraged U.S. Treasury bonds make sense as an ordinary investment – one that rivals the returns of equities but with smaller drawdowns. This article converts theory into practice using the universally accessible futures market, without borrowing money.

My goal is not to set the reader out to do it alone, but rather to demystify the mechanics and show it is possible.

What are futures?

Futures contracts seem more complicated than they really are. Their name and definition imply that traders have an opinion about an asset's price at a particular date in the future. Not so. *Most futures are simply a way to buy and sell assets that are otherwise cumbersome. That's it.* They react to the same information the underlying asset reacts to, at the same time and in the same proportion.

Futures first arose to facilitate the trading of commodities. The innovation was to move the settlement date of a trade (day when money and product are exchanged) out beyond the usual one or two days, to 90 or more days (the *future*), and then to use a single settlement date for a given window of time (the *delivery date* in futures parlance). Moving the settlement day far away allowed traders to buy and sell assets that were big and heavy (think oil, cattle, gold) without immediately having to worry about delivering them. Using a single settlement date created a tradeable market in a single contract. Traders could get into *and out of* the contract before it settled – never having to pay for, or take delivery of the commodity – instead just participating in changes of its price.

That is the crucial mechanism of futures. Consider the example of buying and selling a share of stock on the same day. When those trades settle, the debit from the buy will net against the credit from the sell and only the profit or loss will be left in the account. Because the position was flat by the end of the day, the trader could've bought and sold more shares than they had capital for (leverage), as long as they could cover any possible loss. Futures have formalized this idea of being flat by the settlement date. Since position sizes aren't limited by how much you can purchase, futures exchanges restrict

them with margin requirements – sized in proportion to recent price changes, not the value of the asset.

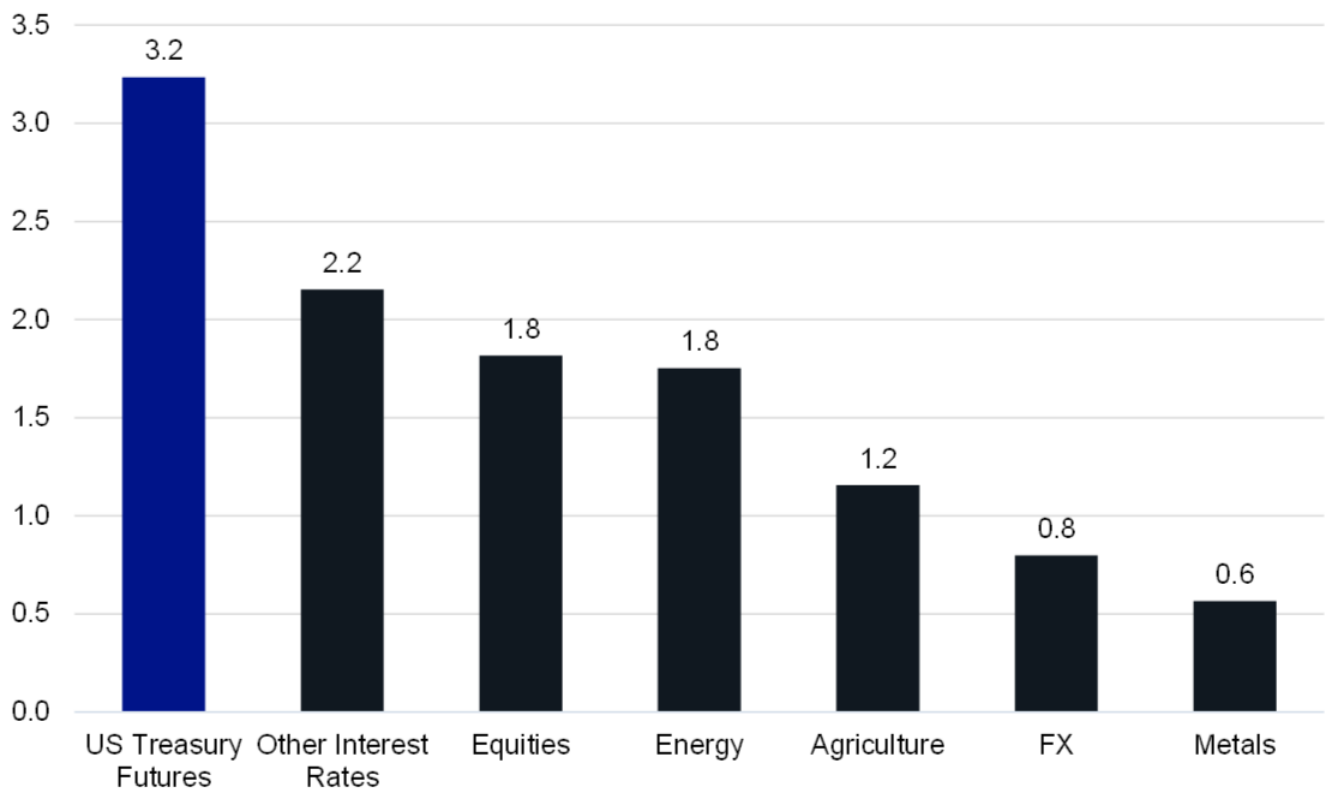
U.S. Treasury futures

It is this ability to leverage without borrowing money that has driven futures to expand beyond the “big and heavy” to financial assets – so-called financial futures. Financial futures are popular because financing the underlying assets is cumbersome. It is doable, but you need access to the right markets, you need them quickly, and often with big numbers. Financial futures track several currencies, bonds and stock indices. Among them is the behemoth U.S. Treasury futures market.

You would be forgiven for thinking U.S. Treasury futures are an obscure corner of finance. Surprisingly, they are the main event. Trading volume in them is the *highest* of any category of futures contract (see chart below).

Futures Trading Volume by Category (CME Group)

1 month average, 7/24/2018 - 8/23/2018
Millions of contracts



Data Source: CME Group | Prepared by Kessler Investment Advisors, Inc. | 09-02-2018

Also, U.S. Treasury futures have been around for a long time, trading now for 41 years. Below is a summary of the six contracts offered, when they began trading, and, historically, the most conservative leverage levels allowed; more leverage than you might think.

U.S. Treasury Futures

Facts, Figures, and History

	Specifications			Leverage
	Contract size (face amount)	Yield Curve Point (years to maturity) ¹	Contract Trading Since	Lowest historical leverage allowed ²
2yr UST Note	\$200,000	2.0	6/25/1990	88
5yr UST Note	\$100,000	4.4	5/20/1988	46
10yr UST Note	\$100,000	6.8	5/3/1982	35
Ultra-10yr UST Note	\$100,000	9.6	1/11/2016	55
Long UST Bond	\$100,000	17.4	8/22/1977	31
Ultra-Long UST Bond	\$100,000	25.4	1/11/2010	15

¹ Measured using cheapest to deliver bonds on 8/31/2018

² Combination of highest ever margin charged with lowest observed closing price for that contract

Source: Bloomberg | Prepared by Kessler Investment Advisors, Inc. | 09/02/2018

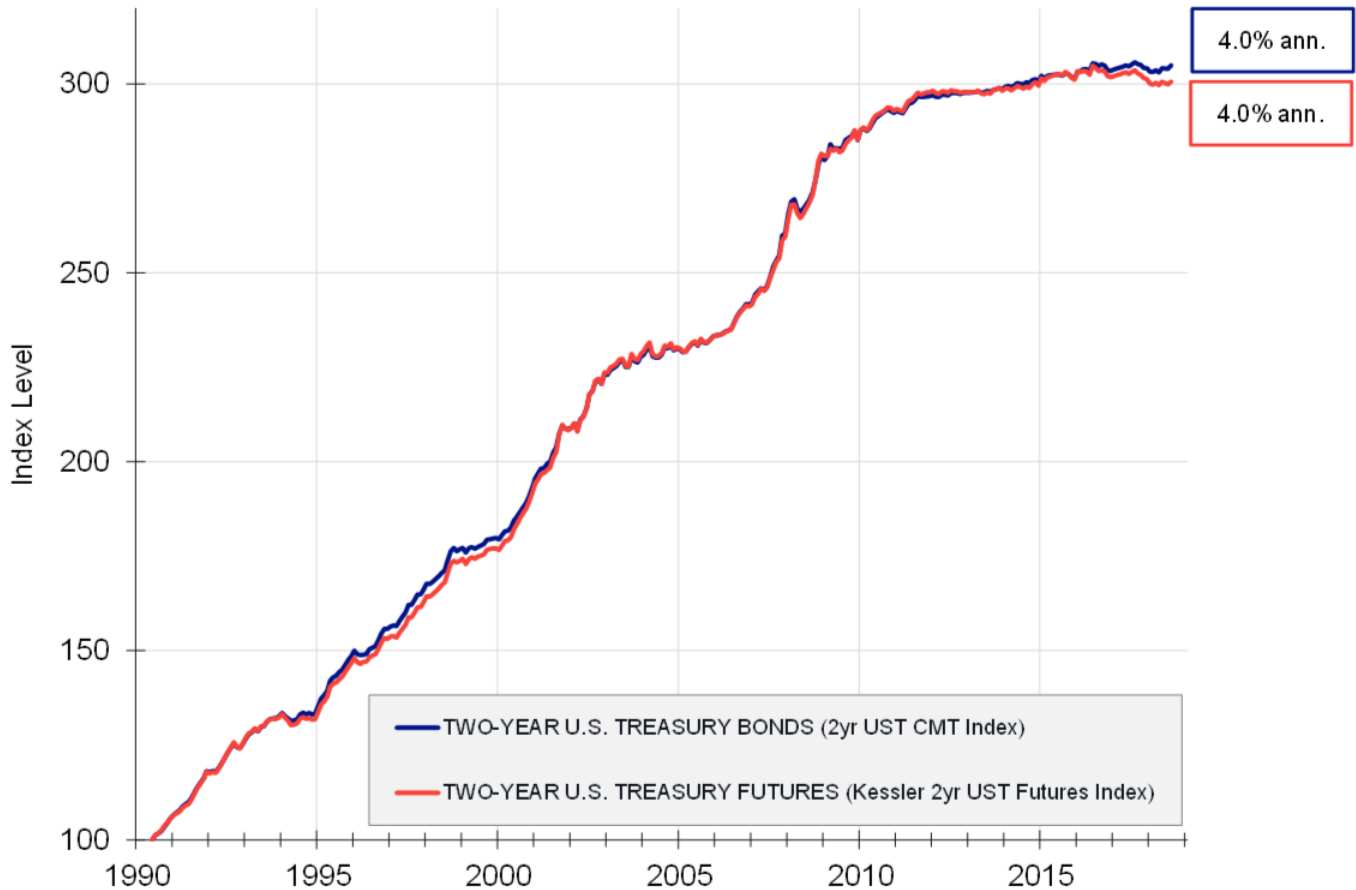
U.S. Treasury futures in a portfolio

Because markets ensure through arbitrage that two ways of doing the same thing are priced the same (the fundamental theorem of asset pricing), U.S. Treasury futures include the profit or loss from carrying them versus if they were owned and financed. Put another way, U.S. Treasury futures include the entire economic impact of holding actual Treasury securities. They include the price change from yield movement, coupon cash flow, cost-to-finance and yield curve roll-down.

This is best illustrated by considering futures over a long period – first without leverage. The blue line below is an index representing the performance from successive two-year U.S. Treasury bonds. The red line is an index representing the performance from a series of two-year U.S. Treasury futures sized to the amount of cash in a futures account. Their performance is nearly identical.

Two-year U.S. Treasury Bonds vs. Two-year U.S. Treasury Futures

28.2 years, 06/30/1990 - 8/31/2018



Source: Ryan Labs and Kessler | Prepared by Kessler Investment Advisors, Inc. | 09-02-2018

The Kessler two-year UST Futures Index shows the total return for holding successive two-year U.S. Treasury futures contracts sized to the amount of cash in a futures account (i.e. without leverage). Cash is assumed to earn the Fed Funds effective rate less 50 basis points or 0% when this is less than 0% (i.e. 2008 - 2015). Trading assumes full bid/offer spread (1 tick) and \$5/contract per side. Contracts are rolled quarterly. The index is size-independent, assuming contract granularity is infinite. It is rebalanced daily.

Leveraged U.S. Treasury futures for risk-parity

In the prior article, I showed a simple transformation of the Bloomberg Barclay's U.S. Treasury index, leveraging it 3.3 times; with leverage chosen so that it had the same monthly return volatility as the S&P 500. But, the Bloomberg Barclays U.S. Treasury Index is a representation of the whole Treasury market. And, as such, it is influenced by how much and where the U.S. Treasury Department issues

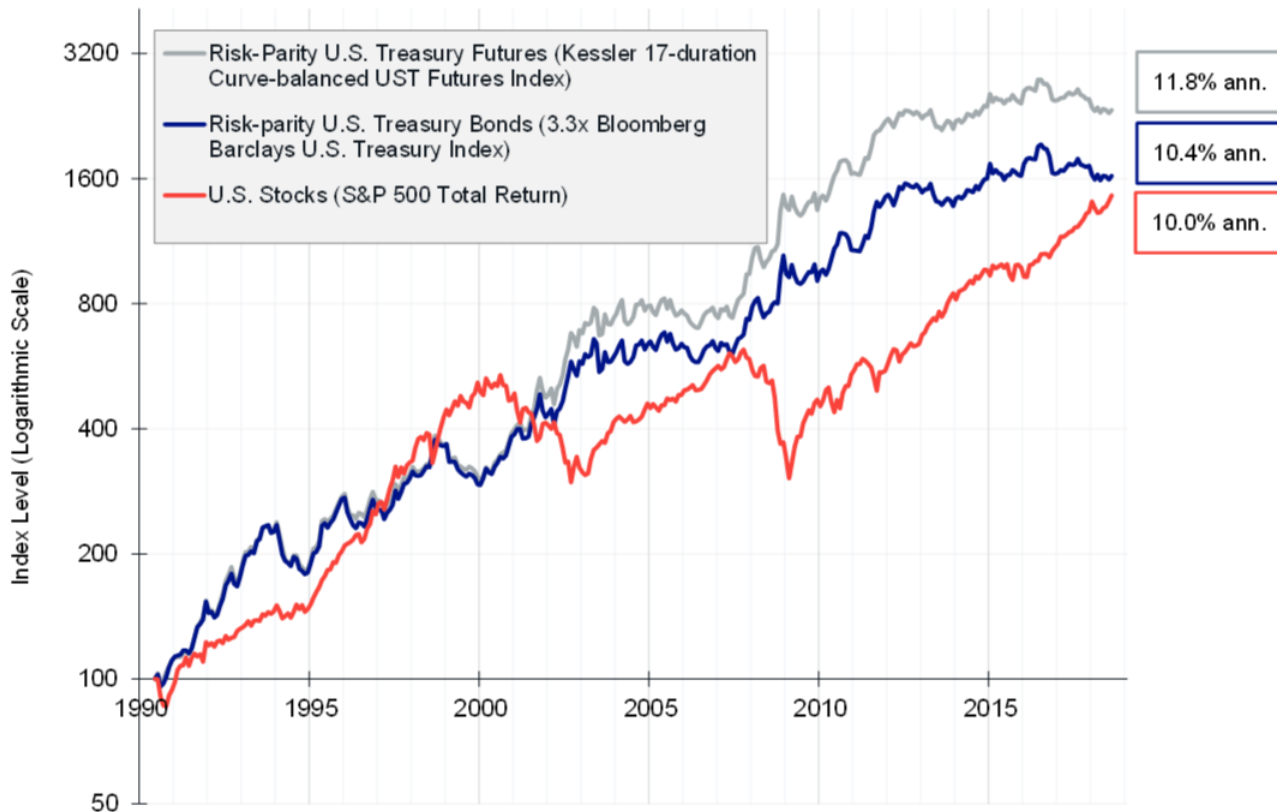
debt over time. In other words, the Treasury index's exposure is unevenly focused across the yield curve and changes over time.

From a portfolio management perspective, it makes sense to neutralize this shadow yield curve management. Also, the prior index had a fixed amount of leverage – 3.3 times. It makes more sense to target portfolio duration, the portfolio's sensitivity to a change in interest rates, and allow leverage to float.

The index below makes these changes by assuming equal amounts of portfolio duration from the four longest-trading U.S. Treasury futures, the two-year, five-year, 10-year, and bond future. Total duration exposure (17) was chosen so that the index had the same monthly return volatility as the S&P 500. Leverage in this index varies between 3.3 and 4.6. As you can see, this futures implementation performs even better, still avoiding the near 50% drawdowns of the stock market.

U.S. Stocks versus Risk-parity U.S. Treasury Bonds, Futures

28.2 years, 06/30/1990 - 8/31/2018



	Risk-Parity U.S. Treasury Futures	Risk-parity U.S. Treasury Bonds	U.S. Stocks
Annualized Return	11.8%	10.4%	10.0%
Ann.Standard Deviation	14.0%	14.1%	14.1%
Worst Drawdown	-23.3%	-23.9%	-50.9%

Source: Bloomberg and Kessler | Prepared by Kessler Investment Advisors, Inc. | 09-02-2018

The Kessler 17-duration Curve-balanced U.S. Treasury Futures Index is the total return from the ownership of successive U.S. Treasury Futures since 6/30/1990 (inception of two-year UST Futures). The index assumes equal duration exposure from the 4 longest-standing futures contracts, the two-year (TU), five-year (FV), 10-year (TY) and Long-bond (U.S.) contracts. Portfolio duration exposure is maintained at 17 units. Cash is assumed to earn the Fed Funds effective rate less 50 basis points or 0% when this is less than 0% (i.e. 2008 - 2015). Trading assumes full bid/offer spread (one tick) and \$5/contract per side. Contracts are rolled quarterly. The index is size-independent, assuming contract granularity is infinite. It is rebalanced daily.

This index is comfortably over-margined, coming nowhere near a margin call. The maximum margin required was just 7.8% of equity on its worst day, meaning that its value needed to fall another 92.2%

before a margin call would've occurred.

The index above shows the passive performance with exposure throughout the yield curve. But, as discussed in the prior article, the ability to leverage gives an investor the freedom to concentrate exposure at different places of the curve during different yield environments. For instance, when the Federal Reserve is lowering rates, it is preferable to have exposure concentrated at the front end of the yield curve.

These two articles illustrate that leveraged U.S. Treasury bonds are both important and accessible for more than just institutions. Hiding in plain sight, this is a sensible investment.

Eric Hickman is president of Kessler Investment Advisors, an advisory firm located in Denver, Colorado specializing in U.S. Treasury bonds.

Disclaimer: Trading futures involves the risk of loss. Please consider carefully whether futures are appropriate to your financial situation. Only risk capital should be used when trading futures. Investors could lose more than their initial investment. Past results are not necessarily indicative of future results. The risk of loss in trading can be substantial, carefully consider the inherent risks of such an investment in light of your financial condition.